

The composite contains organic peroxide microwave sensitive polymerization initiators. The organic peroxide in accordance with this invention comprises benzoyl peroxide, dilauroyl peroxide, (tert-butyl peroctoate or tert-butyl perbenzoate, 2,4-dichlorobenzoyl peroxide and 4,4'-dechlorobenzoyl peroxide) in the weight range of the composition of 0.05% to 1.0 %, preferably in the range of 0.09 to 0.5%, and amine accelerators, comprising N, N-diethanol-p-toluidine, or triethylamine.

The polymerizable resin combinations include Bis-GMA and TEGDMA, and can have a mixture ratio of 0.3 to 0.7, preferably in the range of 0.5, and is suitable to the method and apparatus disclosed in this invention by the use of provided microwave sensitive polymerization initiators for making and using the curable material system. Urethane dimethacrylate can be substituted for TEGDMA.

The inorganic filler particles in accordance with the invention comprise (silica) calcium, strontium, lanthanum, barium, rare earth, alumina, silicate in crystalline, or in aluminosilicate with a zeolite structure, and fluoride of the rare earth metals or mixtures of such fluorides (glass pyrogenically produced, ceramics, zirconium. They comprise particle sizes ranging from 0.04 micrometers to approximately 10 micrometers, preferably being distributed between 1 and 7 micrometers. Composites can also exclusively contain submicron colloidal silica, or pre-polymerized polymer containing colloidal silica, having particles. They can also contain metal particles having sizes ranging from 0.04 micrometers to approximately 10 micrometers, preferably being distributed between 1 and 7 micrometers. The metal particles can be pure gold, or silver, or alloys of silver and tin, which may be surface-modified with a coating of pure silver or pure gold.